O OH O

Alendronate

CH₃

 $(CH_2)_4$ $O^- R^1 O^-$ O_OH $O^ R^2$ O^- Ibandronate Bisphosphonate NH, CH₂ O CH, O O CH₃ O O Cl O O OH O O_{-} OH O_{-} O Cl O Pamidronate Clodronate Etidronate NH_2 CH₂ CH_2 O CH₂O

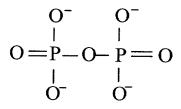
FIGURE 1

O H O

Risedronate

Tiludronate

Title: COMPOSITIONS AND METHODS FOR TREATMENT OF METABOLIC BONE DISORDERS AND BONE METASTASES Applicant: CHEN, JAMES Filed: July 13, 2001 Serial No.: 09/905,405 Examiner: Unassigned Our Docket No.: 25886-0060



Pyrophosphate

FIGURE 2

$$O^{-}$$
 O^{-} O^{-}

Thiobisphosphonate

$$O^{-}$$
 O^{-} O^{-}

Nitrobisphosphonate

FIGURE 3